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APPLICATION FOR UNITED STATES LETTERS PATENT

ON INVENTION FOR:

LARYNGOSCOPE FOR SIMULTANEOUSLY FACILITATING THE
ILLUMINATING OF A THROAT PATHWAY AND INSERTING AN INTUBATION
TUBE

BY INVENTOR: Magdy S. Girgis

Agt. Doc. No.: GRIM66A

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TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN that I, Magdy S. Girgis, a citizen of
THE UNITED STATES OF AMERICA and resident of: Brooklyn, NY
11236 have invented certain new and useful improvements in
a(n): LARYNGOSCOPE FOR SIMULTANEOUSLY FACILITATING THE
ILLUMINATING OF A THROAT PATHWAY AND INSERTING AN INTUBATION
TUBE of which the following is a full, clear, concise and
exact description:

1 Inventor: Magdy S. Girgis
2 Invention: LARYNGOSCOPE FOR SIMULTANEOUSLY FACILITATING THE
3 ILLUMINATING OF A THROAT PATHWAY AND INSERTING AN
4 INTUBATION TUBE
5 DOC. No.: GRIM66A

6 BACKGROUND OF THE INVENTION

7 Field of the Invention:

8 The present invention relates to a laryngoscope. More particularly,
9 the present invention relates to a laryngoscope for simultaneously
10 spreading the epiglottis and the posterior tissue defining the superior
11 opening of the larynx away from each other for opening up the trachea and
12 exposing the larynx.

13 Description of the Prior Art:

14 Laryngoscopes generally comprise a blade and a cooperating,
15 detachable handle which are connected together into an L-shaped
16 configuration. When using the device to view the larynx, the surface on
17 the blade adjacent the handle is used to press against the tongue and
18 mandible of a patient in a supine position in order to prevent the
19 patient's tongue from obstructing the view during the visual examination.
20 While the instrument is useful in examining the larynx, the primary
21 function of the laryngoscope is to expose the larynx in order to
22 facilitate the insertion of an endotracheal tube into the trachea of the
23 lungs to administer gases.

24 During the use of the instrument, when pressed against the patient's
25 tongue and mandible, the tip or distal end of the blade is usually
26 positioned at the junction between the base of the tongue and the base of
27 the epiglottis which is thin, leaf shaped lamella in front of the superior

DOC. No.: GRIM66A

1 opening of the larynx. With most patients, the epiglottis will be lifted
2 sufficiently to expose the larynx by rotating the instrument anteriorly
3 (i.e., longitudinally). Usually the patient's head is tilted backwardly
4 to facilitate the examination.

5 With a small fraction of patients, the epiglottis will not be lifted
6 sufficiently to expose the larynx in the usual laryngoscopic procedures.
7 Unfortunately, the small percentage of patients having the anatomical
8 structure which makes the examination of the larynx difficult cannot be
9 determined by visually examining the epiglottis before inserting the
10 laryngoscope. Usually, it is not until the anesthesiologist tries to
11 expose the larynx to administer anesthetic gases, that the difficulty is
12 encountered. The anesthesiologist must then replace the blade being used
13 with a longer and straighter blade which is used to contact the upper edge
14 of the epiglottis and push the epiglottis anteriorly to expose the larynx.
15 However, the view of the larynx is not very complete in this instance and
16 damage is frequently done to the tissue trying to push the epiglottis far
17 enough out of the way to effectively expose the larynx.

18 The need for a laryngoscope which will readily expose the larynx in
19 those patients in which the normal laryngoscopic procedures do not work
20 has been long felt. The present invention satisfies these needs.

21 This need has been fulfilled by U.S. Patent No. 4,573,451 to Bauman,
22 which is incorporated herein by reference thereto, and which forms the
23 basis for the improvements taught by the present invention.

24 Generally Bauman teaches a laryngoscope blade which has a tip at the
25 distal end thereof which is capable of being bent or flexed in the
26 direction of the handle of the laryngoscope. Operable means are provided,
27 preferably at the proximal end of the blade, to bend or flex the tip.
28 When the blade is inserted into a patient's throat so that the bendable
29 tip is located at the base of the patient's epiglottis, the operable means
30 of the bendable tip can be actuated so the tip will bend and thereby
31 further lift the patient's epiglottis in order to expose the patient's

1 larynx. The laryngoscope blade is particularly suitable to the few
2 patients in which the usual laryngoscopic procedures do not adequately
3 expose the patient's larynx.

4 Typically, as shown in FIGURE 1, the laryngoscope 10 has a
5 stationary handle 11, a stationary blade 13 having a proximal end 15 from
6 which it extends generally normally forwardly from the stationary handle
7 11 and a distal end 17, a tip 19 pivotally attached to the distal end 17
8 of the stationary blade 13, a movable handle 23 pivotally attached to the
9 proximal end 15 of the stationary blade 13 and operatively connected to
10 the tip 19, and an arm 25 operatively attached to the movable handle 23
11 and the tip 19 and pivoting the tip 19 downwardly when the movable handle
12 23 is moved towards the stationary handle 11 for depressing the
13 epiglottis. In contradistinction, as best seen in FIGURE 2 and 3, the
14 flexible tip laryngoscope 10 of the present invention has a double set of
15 blades wherein the addition of a movable blade 22 is for clearing a path
16 for a fiber optic seeing stylet 46 and simultaneously lifting patient's
17 epiglottis 12 while pushing the tongue and the posterior pharyngeal wall
18 out of the way so as to permit light from the light tip element 48 of to
19 illuminate the path way and facilitate the inserting of intubation tube
20 50.

21 Numerous other innovations for laryngoscopes have been provided in
22 the prior art that will be described. Even though these innovations may
23 be suitable for the specific individual purposes to which they address,
24 however, they differ from the present invention.

25 A SECOND EXAMPLE, U.S. Patent No. 3,943,920 to Kandel teaches a
26 laryngoscope blade that includes an upper wall, a lower wall, and a side
27 wall joining the upper and lower walls. The upper wall includes an upper
28 lip engaging portion and an upper gum engaging portion which are
29 contiguous with one another. The lower wall includes a tongue engaging
30 portion and a tip portion disposed for engaging and lifting the
31 epiglottis. The gum portion is substantially parallel to a major extent

1 of the lower wall, whereas the lip portion extends at an acute angle with
2 respect thereto. An inner surface of the upper wall, at the juncture of
3 the gum portion and the lip portion, is provided with a groove and the
4 inner surface of the tip portion is provided with another groove. The
5 bottom surfaces of the grooves are aligned with one another, such that a
6 line of sight extends along such surfaces from each end of the blade.

7 A THIRD EXAMPLE, U.S. Patent No. 4,114,609 to Moses teaches a
8 laryngoscope blade comprising an essentially straight blade portion have
9 the inner end portion which is curved out of the plane of the straight
10 blade portion, and which curved portion is adapted to be received in the
11 groove defined between the base of the tongue and the epiglottis of a
12 patient whereby the tip end causes the tongue to be moved anteriorly to
13 expose the inlet of the larynx and the straight portion of the blade
14 defines a line of sight directly into the larynx.

15 A FOURTH EXAMPLE, U.S. Patent No. 4,592,343 to Upsher teaches an
16 improved laryngoscope having a blade which is curved and tubular and has
17 an improved light means for illuminating the forward end of the blade.
18 In a number of embodiments of the laryngoscope, a light source is mounted
19 in the upper end of the handle of the laryngoscope so the handle can be
20 used with a conventional laryngoscope blade or a non-conventional
21 laryngoscope blade. In one embodiment, the light source is carried by an
22 adapter removably mounted on the handle near the location where the handle
23 and blade are interconnected.

24 A FIFTH EXAMPLE, U.S. Patent No. 5,003,962 to Choi teaches a
25 laryngoscope with an improved double-angle blade or spatula which has
26 three segments lengthwise. The first segment extends in a direction
27 substantially normal to the handle to a first bend, at which the blade or
28 spatula is bent toward the handle through an angle of 20 degrees. The
29 second segment extends in a new direction to a second bend inward through
30 an angle of 30 degrees, forming a third segment which extends to the
31 distal tip. A small cylindrical bulb is superposed adjacent to and

1 parallel to the top edge, near the end of the second segment. This is
2 energized by batteries in the handle.

3 A SIXTH EXAMPLE, U.S. Patent No. 6,251,069 B1 to Mentzelopoulos et
4 al. teaches a laryngoscope having a flexible blade which is hinged and
5 having in the handle articulation control for the hinged portion of the
6 blade as well as an actuator for a pair of balloons on the blade connected
7 with double-lumen tubes.

8 It is apparent that numerous innovations for laryngoscopes have been
9 provided in the prior art that are adapted to be used. Furthermore, even
10 though these innovations may be suitable for the specific individual
11 purposes to which they address, however, they would not be suitable for
12 the purposes of the present invention as heretofore described.

- 1 understood from the following description of the specific embodiments when
- 2 read and understood in connection with the accompanying drawing.

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BRIEF DESCRIPTION OF THE DRAWING

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The figures of the drawing are briefly described as follows:

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FIGURE 1 is a diagrammatic perspective view of a typical prior art laryngoscope;

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FIGURE 2 is a diagrammatic side elevational view of the laryngoscope of the present invention in use simultaneously spreading the epiglottis and the posterior tissue defining the superior opening of the larynx away from each other for opening up the trachea and exposing the larynx;

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FIGURE 3 is an enlarged diagrammatic perspective view, with parts broken away, of the area generally enclosed by the dotted curve identified by ARROW 3 in FIGURE 2 of the laryngoscope of the present invention in the operative position;

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FIGURE 4 is an enlarged diagrammatic perspective view, with parts broken away, taken generally in the direction of ARROW 4 in FIGURE 3;

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FIGURE 5 is a reduced diagrammatic perspective view taken generally in the direction of ARROW 5 in FIGURE 3 of the laryngoscope of the present invention in the relaxed position;

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FIGURE 6 is a reduced, exploded diagrammatic perspective view of the area generally enclosed by the dotted curve identified by ARROW 6 in FIGURE 3;

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FIGURE 7 is a diagrammatic perspective view of the area generally enclosed by the dotted curve identified by ARROW 7 in FIGURE 3; and

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FIGURE 8 is reduced diagrammatic top plan view taken generally in the direction of ARROW 8 in FIGURE 4.

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LIST OF REFERENCE NUMERALS UTILIZED IN THE DRAWING

2 10 laryngoscope of present invention for simultaneously spreading
3 epiglottis 12 and posterior tissue 14 defining superior opening
4 16 of larynx 18 away from each other for opening up trachea 20
5 and exposing larynx 18
6 11 stationary handle
7 12 epiglottis
8 13 stationary blade
9 14 posterior tissue defining superior opening 16 of larynx 18
10 15 proximal end of stationary blade 13
11 16 superior opening of larynx 18
12 17 distal end of stationary blade 13
13 18 larynx
14 19 tip
15 20 trachea
16 22 movable blade for spreading posterior tissue 14 defining superior
17 opening 16 of larynx 18 away from epiglottis 12 and opening up
18 trachea 20 exposing larynx 18
19 23 movable handle
20 24 lock
21 25 arm
22 26 distal end of movable handle 23
23 28 through bore through distal end 26 of movable handle 23 of lock
24 24
25 29 boundary defining through bore 28 through distal end 26 of
26 movable handle 23 of lock 24
27 30 distal end of stationary handle 11
28 31 spring end of lock 24
29 32 strip of lock 24
30 34 ratchet surface of strip 32 of lock 24

1	36	proximal end of movable handle 23
2	38	connector of movable handle 23
3	40	proximal end of movable blade 22
4	42	first portion of connector 38 of movable handle 23
5	44	second portion of connector 38 of movable handle 23
6	46	fiber optic seeing stylet
7	48	light tip element of fiber optic seeing stylet 46
8	50	intubation tube

1 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

2 Referring now to the figures, in which like numerals indicate like
3 parts, and particularly to FIGURE 2, the laryngoscope of the present
4 invention is shown generally at 10 for simultaneously spreading the
5 epiglottis 12 and the posterior tissue 14 defining the superior opening
6 16 of the larynx 18 away from each other for opening up the trachea 20 and
7 exposing the larynx 18.

8 The configuration of the laryngoscope 10 can best be seen in FIGURES
9 3-8, and as such, will be discussed with reference thereto.

10 The laryngoscope 10 comprises a movable blade 22. The movable blade
11 22 is pivotally attached to the stationary blade 13 and affixed to the
12 movable handle 23 for movement therewith so as to allow the movable blade
13 22 to pivot away from the stationary blade 13 when the movable handle 23
14 is moved towards the stationary handle 11 for spreading the posterior
15 tissue 14 defining the superior opening 16 of the larynx 18 away from the
16 epiglottis 12 as the tip 19 depresses the epiglottis 12 and both thereby
17 opening up the trachea 20 exposing the larynx 18.

18 The laryngoscope further comprises a lock 24. The lock 24 locks the
19 movable blade 22 in a desired position by locking the movable handle 23
20 affixed thereto.

21 The lock 24 includes the movable handle 23 having a distal end 26
22 with a through bore 28 therethrough defined by a boundary 29 and the
23 stationary handle 11 having a distal end 30 from which extends, at a
24 spring end, a strip 32 that passes selectively lockingly through the
25 through bore 28 in the distal end 26 of the movable handle 23 of the lock
26 24.

27 The strip 32 of the lock 24 is arcuate and has a ratchet surface 34.
28 The ratchet surface 34 of the strip 32 of the lock 24 selectively engages
29 the boundary 29 of the through bore 28 through the distal end 26 of the
30 movable handle 23.

1 The movable handle 23 has a proximal end 36 and a connector 38 and
2 the movable blade 22 has a proximal end 40. The connector 38 of the
3 movable handle 23 extends fixedly from the proximal end 36 of the movable
4 handle 23 fixedly to the proximal end 40 of the movable blade 22 so as to
5 allow the movable blade 22 to move with the movable handle 23.

6 The movable blade 22 extends substantially over the stationary blade
7 13 plus the tip 19.

8 The movable blade 22 extends flat and horizontally from the proximal
9 end 40 of the movable blade 22, which is flat and vertical.

10 The connector 38 of the movable handle 23 is generally L-shaped, and
11 has a first portion 42 and a second portion 44. The first portion 42 of
12 the connector 38 of the movable handle 23 fixedly and coplanarly abuts the
13 proximal end 36 of the movable handle 23. The second portion 44 of the
14 connector 38 of the movable handle 23 extends normally rearwardly from the
15 first portion 42 of the connector 38 of the movable handle 23 and is
16 fixedly attached to the proximal end 40 of the movable blade 22.

17 It will be understood that each of the elements described above, or
18 two or more together, may also find a useful application in other types
19 of constructions differing from the types described above.

20 While the invention has been illustrated and described as embodied
21 in a laryngoscope for simultaneously spreading the epiglottis and the
22 posterior tissue defining the superior opening of the larynx away from
23 each other for opening up the trachea and exposing the larynx, however,
24 it is not limited to the details shown, since it will be understood that
25 various omissions, modifications, substitutions and changes in the forms
26 and details of the device illustrated and its operation can be made by
27 those skilled in the art without departing in any way from the spirit of
28 the present invention.

29 Without further analysis, the foregoing will so fully reveal the
30 gist of the present invention that others can, by applying current
31 knowledge, readily adapt it for various applications without omitting

- 1 features that, from the standpoint of prior art, fairly constitute
- 2 characteristics of the generic or specific aspects of this invention.